



TECHNICAL GUIDE

AFFINITY

MODELS: PV9

GAS-FIRED CONDENSING / HIGH EFFICIENCY TWO STAGE VARIABLE UPFLOW FURNACES

UP TO 94% AFUE

**NATURAL GAS
40 - 120 MBH INPUT**



This product was manufactured in a plant whose quality system is certified/registered as being in conformity with ISO 9001.



Due to continuous product improvement, specifications are subject to change without notice.

Visit us on the web at www.york.com for the most up-to-date technical information.

Additional rating information can be found at www.gamanet.org.

DESCRIPTION

These Category IV, highly efficient, compact, condensing type furnaces are designed for residential and commercial installations in a basement, closet, alcove, recreation room or garage where the ambient temperature is above 32°F, or higher. They may be either side wall or thru-roof vented using approved plastic type combustion air and vent piping. All units are factory assembled, wired and tested to assure dependable and economical installation and operation.

WARRANTY

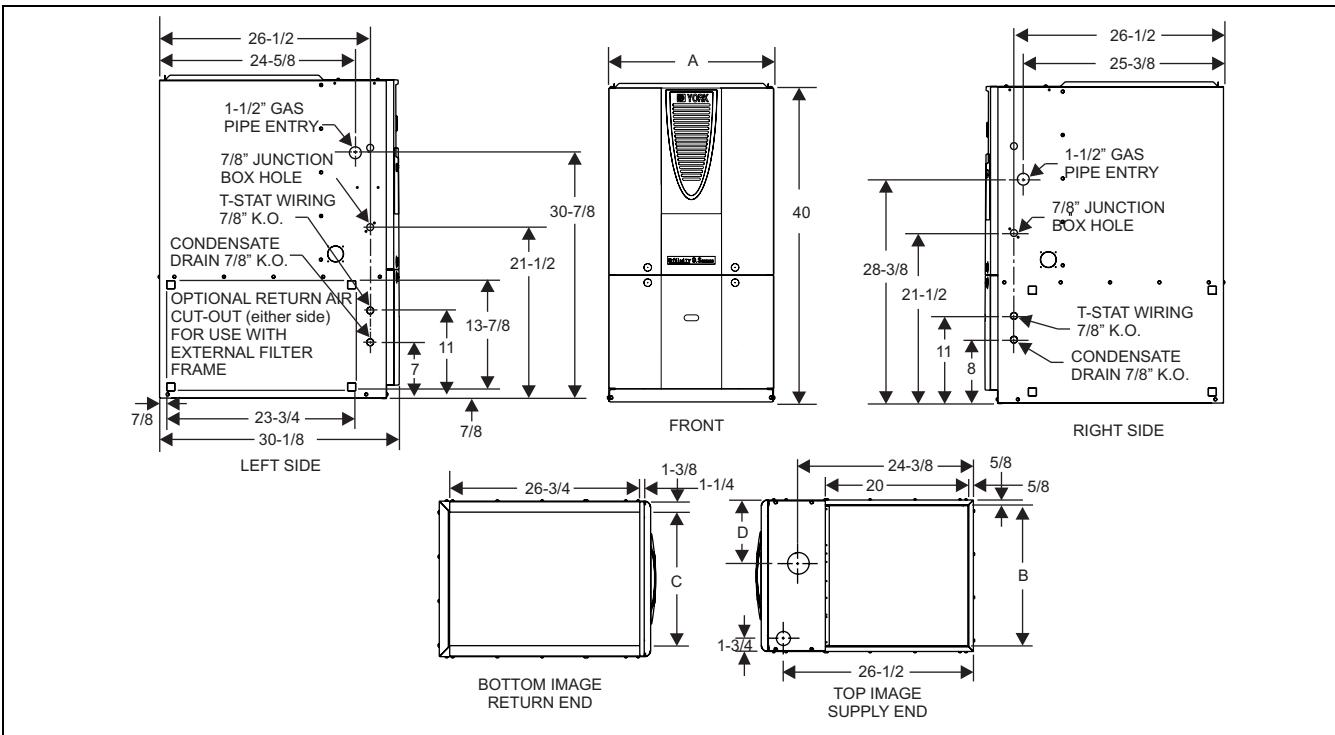
Lifetime limited warranty on both heat exchangers to the original purchaser; a 20-year limited warranty from original installation date to subsequent purchaser.

10-year warranty on commercial applications.

5-year limited parts warranty.

FEATURES

- Two stage heating operation includes:
 - Two stage gas valve
 - Two stage inducer operation
 - Variable speed ECM blower operation
- Provides increased comfort level & very quiet unit operation
- Adjustable delay timer allows two stage operation with single stage thermostat
- Compact, easy to install, ideal height 40" cabinet
- Blower-off delay for cooling SEER improvement.
- Easy to connect power/control wiring.
- Built-in, high level self diagnostics with fault code display.
- Low unit amp requirement for easy replacement application.
- Integrated control module for reliable, economical operation.
- High velocity filter and side -return filter rack provided for easy field installation.
- May be installed as either two-pipe (sealed combustion) or single pipe vent (using indoor combustion air)
- Top intake & vent connection allows installation in narrow locations.
- Electronic Hot Surface Ignition saves fuel cost with increased dependability and reliability.
- Induced combustion system with inshot main burners for quiet, efficient operation.
- No special vent termination kit required.
- 100% shut off main gas valve for extra safety.
- 24V, 40 VA control transformer and blower relay supplied for add-on cooling.
- Hi-tech tubular aluminized steel primary heat exchanger.
- Secondary (condensing) heat exchanger of 29-4C high-grade stainless steel.
- Timed on, adjustable off blower capability for maximum comfort.
- Solid removable bottom panel allows easy application.
- Easy access from front of unit for cleaning, maintenance or service.
- Protection from intake, exhaust or condensate blockage.
- Insulated blower compartment for quiet operation.
- ClimaTraK comfort system allows dealer to customize comfort settings based on regional location.

**DIMENSIONS**

Models	CFM	Cabinet Size	Cabinet Dimension			Air Intake D (in.)
			A (in.)	B (in.)	C (in.)	
PV9A12N040UP11	1200	A	14-1/2	13-1/2	12-1/8	6-1/4
PV9B12N060UP11	1200	B	17-1/2	16-1/4	15-1/8	8-1/2
PV9B12N080UP11	1200	B	17-1/2	16-1/4	15-1/8	8-1/2
PV9C16N080UP11	1600	C	21	19-3/4	18-1/2	8-7/8
PV9C20N100UP11	2000	C	21	19-3/4	18-1/2	8-7/8
PV9D20N120UP11	2000	D	24-1/2	23-1/4	21-7/8	10-5/8

COMBUSTION AIR SUPPLY AND VENT PIPING

Models	Pipe Size Inches (cm)	Maximum Number of Elbows*								Minimum Length
		1	2	3	4	5	6	7	8	
40,000	1-1/2	30	25	20	10	N/A	N/A	N/A	N/A	5
40,000	2	70	65	60	55	50	45	35	25	5
60,000	1-1/2 (3.8)	30	25	20	10	N/A	N/A	N/A	N/A	5
60,000	2 (5.1)	60	55	50	45	40	30	20	10	5
60,000	3 (7.6)	85	80	75	70	65	60	50	40	20
80,000	1-1/2 (3.8)	20	15	N/A	N/A	N/A	N/A	N/A	N/A	5
80,000	2 (5.1)	60	55	50	45	40	30	20	10	5
80,000	3 (7.6)	85	80	75	70	65	60	50	40	20
100,000	2 (5.1)	25	20	15	N/A	N/A	N/A	N/A	N/A	5
100,000	3 (7.6)	85	80	75	70	65	60	50	40	20
120,000	3 (7.6)	75	70	65	60	55	45	35	25	5

Three elbows (two in vent pipe and one in the air intake pipe) are already accounted for and need not be included in the elbow count from the Table above.

HIGH ALTITUDE PRESSURE SWITCH APPLICATION

Models	High Altitude Pressure Switch Kit
	4,500 Ft to 10,000 Ft.
PV9A12N040UP11	1PS0506
PV9B12N060UP11	1PS0501
PV9B12N080UP11	1PS0502
PV9C16N080UP11	1PS0503
PV9C20N100UP11	1PS0505
PV9D20N120UP11	1PS0503

NOTE: For high altitude conversion, an orifice change may also be required. See Form 035-14447-001 for application information.

ELECTRICAL AND PERFORMANCE DATA

Models	Input High/Low	Output High/Low	Nominal Airflow	AFUE	Air Temp. Rise	Max. Outlet Air Temp.	Blower		Blower Size	Total Unit	Max. Over-current Protect	Min. Wire Size (awg) @ 75 ft. One Way
	MBH	MBH	CFM	%	°F	°F	HP	Amps	In.	Amps		
PV9A12N040UP11	40/26	38/24	1200	94.0	35-65	165	1/2	7.7	11x8	9	20	14
PV9B12N060UP11	60/39	56/36	1200	93.2	40-70	170	1/2	7.7	11x8	9	20	14
PV9B12N080UP11	80/52	75/49	1200	92.5	45-75	175	1/2	7.7	11x8	9	20	14
PV9C16N080UP11	80/52	75/49	1600	92.8	45-75	175	3/4	9.6	11x10	12	20	14
PV9C20N100UP11	100/65	93/60	2000	92.8	45-75	175	1	12.8	11x11	14	20	12
PV9D20N120UP11	120/78	112/73	2000	93.2	40-70	170	1	12.8	11x11	14	20	12

Annual Fuel Utilization Efficiency (AFUE) numbers are determined in accordance with DOE Test procedures.

Wire size and over current protection must comply with the National Electrical Code (NFPA-70-latest edition) and all local codes.

The furnace shall be installed so that the electrical components are protected from water.

FILTER SIZES

Models	CFM	Cabinet Size	Side Return Filter in. (cm)	Bottom Return Filter in. (cm)
PV9A12N040UP11	1200	A	16 x 25	14 x 25
PV9B12N060UP11	1200	B	16 x 25	16 x 25
PV9B12N080UP11	1200	B	16 x 25	16 x 25
PV9C16N080UP11	1600	C	16 x 25	20 x 25
PV9C20N100UP11	2000	C	16 x 25	20 x 25
PV9D20N120UP11	2000	D	(2) 16 x 25	22 x 25

* ESP (External Static Pressure) .5" WG is at furnace outlet ahead of cooling coil.

NOTES:

1. All filters must be high velocity cleanable type.
2. Air flows above 1800 CFM require either return from two sides or one side plus bottom.

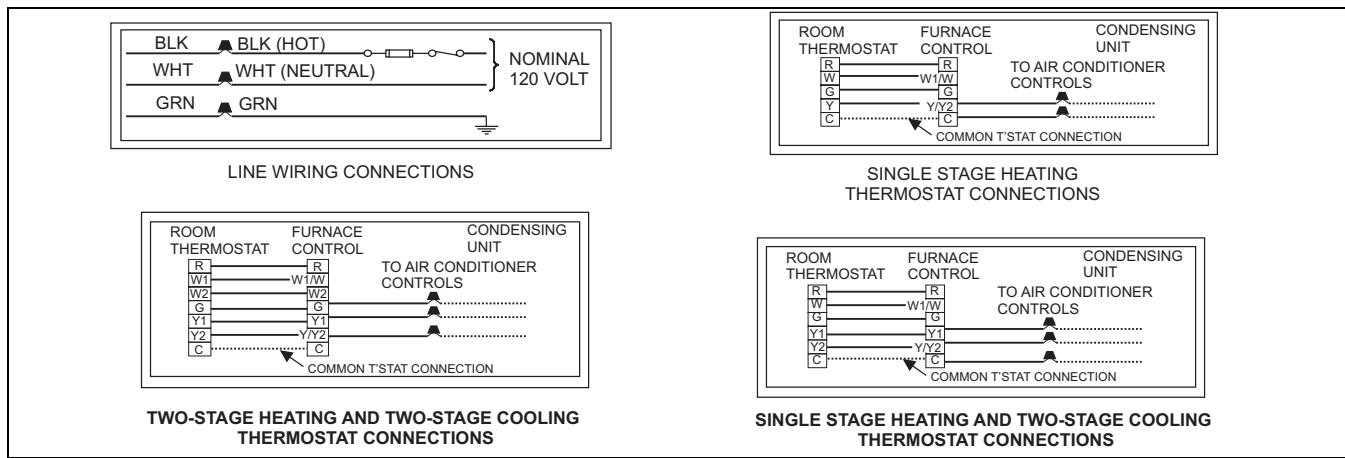
AIR FLOW DATA

HIGH / LOW SPEED COOLING AND HEAT PUMP CFM									
40,000 INPUT - 3 Ton				60,000 INPUT - 3 Ton				JUMPER SETTINGS	
CFM		m³/min		CFM		m³/min			
High	Low	High	Low	High	Low	High	Low	COOL Tap	ADJ Tap
1340	995	38.0	28.2	1330	900	37.7	25.5	A	B
1205	885	34.1	25.1	1130	800	32.0	22.7	B	B
1255	920	35.6	26.1	1220	850	34.6	24.1	A	A
1150	835	32.6	23.7	1040	730	29.4	20.7	B	A
1170	855	33.2	24.2	1120	770	31.7	21.8	A	C
1025	755	29.0	21.4	920	650	26.1	18.4	C	B
1045	780	29.6	22.1	950	660	26.9	18.7	B	C
835	625	23.7	17.7	740	540	21.0	15.3	D	B
950	705	26.9	20.0	860	610	24.4	17.3	C	A
785	590	22.2	16.7	690	540	19.5	15.3	D	A
865	665	24.5	18.8	790	570	22.4	16.1	C	C
725	605	20.5	17.1	630	530	17.8	15.0	D	C
80,000 INPUT - 3 Ton				80,000 INPUT - 4 Ton				JUMPER SETTINGS	
CFM		m³/min		CFM		m³/min			
High	Low	High	Low	High	Low	High	Low	COOL Tap	ADJ Tap*
1310	890	37.1	25.2	1660	1110	47.0	31.4	A	B
1100	740	31.2	21.0	1550	1050	43.9	29.7	B	B
1220	830	34.6	23.5	1610	1070	45.6	30.3	A	A
1000	670	28.3	19.0	1440	960	40.8	27.2	B	A
1090	720	30.9	20.4	1470	990	41.6	28.0	A	C
900	610	25.5	17.3	1370	920	38.8	26.1	C	B
880	610	24.1	17.3	1290	850	36.5	24.1	B	C
680	510	19.3	14.4	1130	790	32.0	22.4	D	B
810	580	22.9	16.4	1230	850	34.8	24.1	C	A
630	500	17.8	14.2	1050	720	29.7	20.4	D	A
730	530	20.7	15.0	1110	760	31.4	21.5	C	C
590	500	16.7	14.2	950	660	26.9	18.7	D	C
100,000 INPUT - 5 Ton				120,000 INPUT - 5 Ton				JUMPER SETTINGS	
CFM		m³/min		CFM		m³/min			
High	Low	High	Low	High	Low	High	Low	COOL Tap	ADJ Tap*
2210	1480	62.6	41.9	2280	1510	64.6	42.8	A	B
1780	1180	50.4	33.4	1860	1190	52.7	33.7	B	B
2040	1350	57.8	38.2	2090	1370	59.2	38.8	A	A
1620	1050	45.9	29.7	1630	1060	46.2	30.0	B	A
1840	1250	52.1	35.4	1880	1250	53.2	35.4	A	C
1560	1010	44.2	28.6	1620	1030	45.9	29.2	C	B
1470	940	41.6	26.6	1500	960	42.5	27.2	B	C
1370	890	38.8	25.2	1410	880	39.9	24.9	D	B
1460	930	41.3	26.3	1490	920	42.2	26.1	C	A
1250	790	35.4	22.4	1290	790	36.5	22.4	D	A
1310	810	37.1	22.9	1360	840	38.5	23.8	C	C
1090	690	30.9	19.5	1140	690	32.3	19.5	D	C
HIGH / LOW HEAT CFM									
40,000 INPUT - 3 Ton				60,000 INPUT - 3 Ton				JUMPER SETTINGS	
CFM		m³/min		CFM		m³/min			
High	Low	High	Low	High	Low	High	Low	HEAT Tap	ADJ Tap*
1045	740	29.6	21.0	1110	710	31.4	20.1	A	Any
905	645	25.6	18.3	960	640	27.2	18.1	B	Any
825	595	23.4	16.8	870	600	24.6	17.0	C	Any
765	590	21.7	16.7	830	570	23.5	16.1	D	Any
80,000 INPUT - 3 Ton				80,000 INPUT - 4 Ton				JUMPER SETTINGS	
CFM		m³/min		CFM		m³/min			
High	Low	High	Low	High	Low	High	Low	HEAT Tap	ADJ Tap*
1330	880	37.7	24.9	1490	990	42.2	28.0	A	Any
1180	810	33.4	22.9	1350	900	38.2	25.5	B	Any
1100	730	31.2	20.7	1220	820	34.6	23.2	C	Any
1010	670	28.6	19.0	1120	770	31.7	21.8	D	Any
100,000 INPUT - 5 Ton				120,000 INPUT - 5 Ton				JUMPER SETTINGS	
CFM		m³/min		CFM		m³/min			
High	Low	High	Low	High	Low	High	Low	HEAT Tap	ADJ Tap*
1880	1230	53.2	34.8	2150	1420	60.9	40.2	A	Any
1670	1080	47.3	30.6	1930	1290	54.7	36.5	B	Any
1530	980	43.3	27.8	1850	1190	52.4	33.7	C	Any
1430	900	40.5	25.5	1660	1070	47.0	30.3	D	Any

All CFM's are shown at 0.5" w.c. external static pressure. These units have variable speed motors that automatically adjust to provide constant CFM from 0.0" to 0.6" w.c. static pressure. From 0.6" to 1.0" static pressure, CFM is reduced by 2% per 0.1" increase in static. Operation on duct systems with greater than 1.0" w.c. external static pressure is not recommended.

NOTE: At some settings, LOW COOL and/or LOW HEAT airflow may be lower than what is required to operate an airflow switch on certain models of electronic air cleaners. Consult the instructions for the electronic air cleaner for further details.

The ADJ "D" tap should not be used.



FILTER PERFORMANCE

The airflow capacity data published in the "Blower Performance" table listed above represents blower performance WITHOUT filters. To determine the approximate blower performance of the system, apply the filter drop value for the filter being used or select an appropriate value from the "Filter Performance" table shown below.

FILTER PERFORMANCE - PRESSURE DROP INCHES W.C. AND (KPA)

Airflow Range	Minimum Opening Size		Filter Type									
			Disposable		WASHABLE FIBER*		Pleated					
	1 Opening	2 Openings	In w.c.	Pa	In w.c.	Pa	In w.c.	Pa	In w.c.	Pa	In w.c.	Pa
Sq. in.	Sq. in.											
0 - 750	230		0.01	2.5			0.01	2.5			0.15	37
751 - 1000	330		0.04	10			0.03	7.5			0.20	50
1001 - 1250	330		0.08	20			0.07	17			0.20	50
1251 - 1500	330		0.08	20			0.07	17			0.25	62
1501 - 1750	380	658	0.14	35	0.08	20	0.13	32	0.06	15	0.30	75
1751 - 2000	380	658	0.17	42	0.09	22	0.15	37	0.07	17	0.30	75
2001 & Above	463	658	0.17	42	0.09	22	0.15	37	0.07	17	0.30	75
											0.17	42

* Washable Fibers are the type supplied with furnace (if supplied).

APPLYING FILTER PRESSURE DROP TO DETERMINE SYSTEM AIRFLOW

To determine the approximate airflow of the unit with a filter in place, follow the steps below:

1. Select the filter type.
2. Select the number of return air openings or calculate the return opening size in square inches to determine the proper filter pressure drop.
3. Determine the External System Static Pressure (ESP) without the filter.

NOTE: The filter pressure drop values in the "Filter Performance" table shown below are typical values for the type of filter listed and should only be used as a guideline. Actual pressure drop ratings for each filter type vary between filter manufacturer.

4. Select a filter pressure drop from the table based upon the number of return air openings or return air opening size and add to the ESP from Step 3 to determine the total system static.
5. If total system static matches a ESP value in the airflow table (i.e. 0.20, 0.60, etc.) the system airflow corresponds to the intersection of the ESP column and Model/Blower Speed row.

ACCESSORIES**PROPANE (LP) CONVERSION KIT -**

1NP0580 - All units

This accessory conversion kit may be used to convert natural gas (N) units for propane (LP) operation. Conversions must be made by qualified distributor or dealer personnel.

CONCENTRIC VENT TERMINATION -

1CT0302 (2")

1CT0303 (3")

For use through rooftop, sidewall. Allows combustion air to enter and exhaust to exit through single common hole.

CONDENSATE NEUTRALIZER KIT - 1NK0301

Neutralizer cartridge has a 1/2" plastic tube fittings for installation in the drain line. Calcium carbonate refill media is also available from the Source 1 Parts (p/n 026-30228-000).

Sidewall Vent Termination - 1HT0901

For use on sidewall, two-pipe installations only. Provides a more attractive termination for locations where the terminal is visible on the side of the home.

EXTERNAL BOTTOM RETURN FILTER RACK W/FILTER -

Provides a cleanable, high velocity type filter and filter rack. Attaches to the bottom of the furnace.

1BR0314 - For 14-1/2" cabinets

1BR0317 - For 17-1/2" cabinets

1BR0321 - For 21" cabinets

1BR0324 - For 24-1/2" cabinets

HIGH ALTITUDE PRESSURE SWITCHES -

These accessory kits may be used to convert units for high altitude operation. Conversion must be made by qualified distributor or dealer personnel.

1PS0501	HIGH ALTITUDE PRESSURE SWITCH KIT (Does Not Include Orifices)	FOR APPLICATION INFORMATION SEE FORM 035-20506-001
1PS0502		
1PS0503		
1PS0504		
1PS0505		
1PS0506		

FIELD INSTALLED ACCESSORIES - ELECTRICAL		
MODEL NO.	DESCRIPTION	USED WITH
2TH07700124	THERMOSTAT- One-stage heat/cool. Manual changeover, integral subbase. System Switch: Cool-Off-Heat. Fan Switch: Auto-On.	ALL MODELS
2TH13700424	THERMOSTAT- One-stage heat. Deluxe 24V with heat only subbase, does not include fan switch. NOTE: For one-stage cool or one-stage heat/cool, must be used with subbase 2TB17700424.	ALL MODELS
2TB17700424	SUBBASE (24V) - One-stage heat/cool. Manual changeover, integral subbase. System Switch: Cool-Off-Heat. Fan Switch: Auto-On.	ALL MODELS
2ET07700224	THERMOSTAT- One-stage heat/cool. Programmable changeover, with subbase. System Switch: Cool-Off-Heat. Fan Switch: Auto-On.	ALL MODELS

NOTES

NOTES

Subject to change without notice. Printed in U.S.A.
Copyright © by York International Corp. 2004. All rights reserved.

036-21584-001 Rev. B (1004)
Supersedes: 036-21584-001 Rev. a (0904)

**Unitary
Products
Group**

**5005
York
Drive**

**Norman
OK
73069**